

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended) A MAP decoder with cascaded architecture for reducing numbers of circuits, comprising:

- (a) inputs for receiving symbols;
- (b) a forward recursion block coupled to said inputs, said forward recursion block with cascade architecture;
- (c) a backward recursion block coupled to said inputs; said backward recursion block with cascade architecture; and
- (d) an output block coupled to said forward recursion block and to said backward recursion block.

Claim 2 (previously presented) The decoder of claim 1, wherein:

- (a) said forward recursion block includes first parallel add-compare-select (ACS) units, second parallel ACS units, and a first transformation unit connecting the outputs of said first ACS units to inputs of said second ACS units;
- (b) said backward recursion block includes third parallel ACS units, fourth parallel ACS units, and a second transformation unit connecting the outputs of said first ACS units to inputs of said second ACS units; and
- (c) said output block couples to the inputs of said ACS units and to said inputs for receiving symbols.

Claim 3 (original) The decoder of claim 1, further comprising:

- (a) an input for extrinsic information coupled to said forward recursion and backward recursion blocks.

Claim 4 (currently amended) A MAP decoder with cascaded architecture for reducing numbers of circuits, comprising:

- (a) inputs for receiving symbols from an encoder with  $2^{n+m}$  states where n and m are positive integers;
- (b) a forward recursion block coupled to said inputs, said forward recursion block with m+1 first sets of add-compare-select (ACS) units, each of said first sets including  $2^n$  ACS units in parallel, said m+1 first sets coupled in series with feedback;
- (c) a backward recursion block coupled to said inputs, said backward recursion block with m+1 second sets of ACS units, each of said second sets including  $2^n$  ACS units in parallel, said m+1 second sets coupled in series with feedback; and
- (d) an output block coupled to said first sets and said second sets of ACS units.

Claim 5 (original) The decoder of claim 4, wherein:

- (a) each of said ACS units includes 1 2-input max\* block; and
- (b) said output block includes  $2(m+1)2^n$  2-input max\* blocks.

Claim 6 (currently amended) A turbo decoder with cascaded architecture for performing channel coding, comprising,

- (a) a first MAP decoder with inputs for receiving symbols and extrinsic information;
- (b) a first interleaver coupled to an output of said first MAP decoder;
- (c) a second interleaver coupled to said inputs for receiving symbols;
- (d) a second MAP decoder with inputs coupled to outputs of said first and said second interleavers and to said inputs for receiving symbols;
- (e) a deinterleaver coupled to an output of said second MAP decoder; and
- (f) a decision unit coupled to said inputs for receiving symbols and outputs of said first MAP decoder and of said deinterleaver;
- (g) wherein said first and said second MAP decoders each includes

(i) a forward recursion block, said forward recursion block with cascade architecture;

(ii) a backward recursion block, said backward recursion block with cascade architecture, and (iii) an output block coupled to said forward recursion block and to said backward recursion block.

Claim 7 (original) The decoder of claim 6, wherein:

(a) the output of said deinterleaver couples to said input for extrinsic information of said first MAP decoder to provide feedback for iterative operation.